



Governor's Office of  
**Economic Development**  
Centers of Excellence

**Jon M. Huntsman, Jr.**  
**Governor through Aug. 10, 2009**

**Gary R. Herbert**  
**Governor from Aug. 11, 2009**

# **ANNUAL REPORT**

**Jason Perry ♦♦ EXECUTIVE DIRECTOR through Sept 2009**  
**Governor's Office of Economic Development**

**Spencer P. Eccles ♦♦ EXECUTIVE DIRECTOR from Sept 2009**  
**Governor's Office of Economic Development**

**Gary Harter ♦♦ MANAGING DIRECTOR**  
**Governor's Office of Economic Development**

**NICOLE TOOMEY DAVIS ♦♦ DIRECTOR**  
**Centers of Excellence**

**Fiscal Year July 2009—June 2010**

## 2009-2010 COE Advisory Council

**Steve Achelis**  
Rescue Rigger (Iterum, LLC)  
Salt Lake City, Utah

**Michael D. Brehm, P. E.**  
Horrocks Engineers / Brehm  
Environmental, LLC  
Salt Lake City, Utah

**William Borghetti**  
Sendside Networks  
Salt Lake City, Utah

**Sally Brown**  
Autoliv  
Brigham City, Utah

**Forrest Fuller, Ph. D.**  
Elitra Pharmaceuticals, Inc.  
La Jolla, California

**George Gerpheide, Ph. D.**  
C2MW4, LLC.  
Salt Lake City, Utah

**Wade Hull**  
Zars Pharma, Inc.  
Salt Lake City, Utah

**Tim Hunt**  
Entrepreneur  
Salt Lake City, Utah

**Sarah Jones**  
Workman Nydegger  
Salt Lake City, Utah

**Michael Keene, PhD**  
Westminster College  
Salt Lake City, Utah

**John Knab**  
Phonex  
Salt Lake City, Utah

**Kevin Laurence**  
Stoel Rives  
Salt Lake City, Utah

**Nikos Linardakis, M.D.**  
(GOED Board Member)  
Tharos Labs  
Salt Lake City, Utah

**Nick Mecham**  
Xbar Ventures  
Salt Lake City, Utah

**Rich Nelson**  
Utah Technology Council  
Salt Lake City, Utah

**Ragula Bhaskar**  
(GOED Board Member)  
FatPipe Networks, Inc.  
Salt Lake City, UT

**Vern Rice**  
Workman Nydegger  
Salt Lake City, Utah

**Richard B. White**  
Earthfax Engineering  
Salt Lake City, Utah

**Hal Widlansky**  
Entrepreneur  
Salt Lake City, Utah

**2009-2010  
Centers of Excellence  
Annual Report**

---

# TABLE OF CONTENTS

---

1. Executive Summary .....	5
2. 2009-2010 Funded Companies	
Cosmas, Inc. (BYU) .....	8
GlycoMira, LLC (UU) .....	9
Heavystone Laboratory, LLC (UU) .....	10
iVeena, LLC (UU).....	11
JSK Therapeutics (UU) .....	12
NanoInjection Technologies, LLC (BYU) .....	13
NeuroAdjuvants, Inc. (UU) .....	14
Sera Prognostics, Inc. (BYU/UU) .....	15
Sparkle Cream, LLC (BYU) .....	16
Thermal Management Technologies, Inc. (USU) .....	17
Thermimage, Inc. (UU) .....	18
Wastewater Compliance Systems, Inc. (UU) .....	19
ViroPan, Inc. (UU).....	20
3. Program Description .....	21
4. 2009-2010 Financial Summary .....	27
5. 2010-2011 Grant Awardees (Review 1) .....	30
6. 2010-2011 Grant Awardees (Review 2) .....	38

# Executive Summary

---

# Executive Summary

## Centers of Excellence (COE)

*The purpose of the Centers of Excellence Program is to accelerate the commercialization of promising technologies that have strategic value for Utah. The program provides grant funding for companies which license technology developed at Utah's colleges and universities, to help accelerate the commercialization process. The process is a competitive annual selection process with grants of up to \$100,000 in the first year of participation and, in a second year, up to the remainder of \$500,000 total over two years of funding. The end goal of the COE Program is to help drive economic development and job creation.*

During the 2007 Legislative Session the Legislature passed and the Governor signed into law changes to the COE statute that permitted ongoing support of grants to companies which are Licensees of technologies developed at Utah's colleges and universities. 2008-09 was the first year that focused the program's funding on Licensee Grants and 2009-10 continued this focus.

This COE grant funding is intended to help accelerate the process of taking these leading- edge technologies to market. Both existing companies and startups are eligible to apply for funding, as long as they have licensed a technology from a Utah college or university and the funds are used to move this technology to market. The goal of the program as part of the Governor's Office of Economic Development is to spur new products and new companies and the associated job creation.

During the 2009-10 fiscal year, the Centers of Excellence program focused exclusively on funding licensees of technologies developed at Utah's colleges or universities, no longer funding Centers within a Utah College or University. The goal of this emphasis was to help accelerate the commercialization of the target technologies and subsequently job creation.

For the 2009-10 fiscal year, the Centers of Excellence Program had a budget of \$2.5 million and received proposals from 28 companies which are licensees of a technology developed at one of Utah's colleges or universities with a total of \$5 million in requested funds. Of the 28 proposals, 13 were awarded funding totaling \$2.46 million.

# 2009-2010 Funded Licensees

---

# Cosmas, Inc.

B R I G H A M Y O U N G U N I V E R S I T Y

## DEFINITION OF COMPANY

Cosmas, Inc., a Licensee of the Center for the Production of Nanometer Sized Metals, Alloys, Metal Oxides and Mixed Metal Oxide Powders. Cosmas was organized to commercialize a novel method of making an almost unlimited array of metal and metal oxide nanoparticles that was developed at the Center. Nanoparticles are being introduced into a plethora of applications which can broadly be categorized as coatings (active and protective) and surface chemically reactive. Cosmas has found its best market opportunities, local technical expertise and application of its technology in the latter, specifically in the field of high surface area chemical catalysts. It is initially focusing on two tracks within the category: 1) catalysts for clean tech applications such as producing liquid fuels (gasoline & diesel) from biomass, and 2) ceramic catalyst support materials used in exhaust gas pollution control and high temperature industrial gas phase processes.

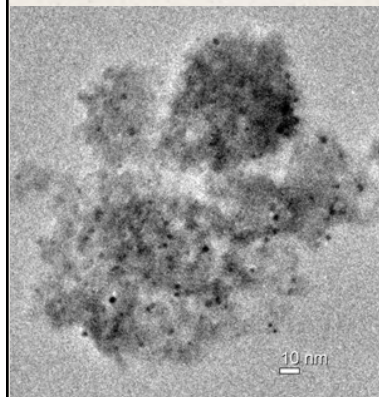
## TECHNOLOGY

The Cosmas method is a very simple, cost effective and environmentally friendly method of making nanoparticles to be used in chemical catalysis. This approach enables a paradigm shift from traditional multi-step, several-day processes currently used to make many catalysts to a simple process requiring no more than a few hours. Cosmas is developing an iron/copper/potassium catalyst for Fisher-Tropsch production of liquid fuels from gases obtained from anaerobic digestion of animal and agricultural waste, or gasification of municipal waste or coal. It is also developing highly porous aluminum oxide ceramic materials which, because of the very small size of the nanoparticle starting materials, is more porous and has more surface area than ceramics produced by current methods.

## PROGRESS

Cosmas is collaborating with three other Utah companies in a biogas-to-liquids coalition, and is exploring commercialization of the alumina ceramic catalyst supports with a large international company. With COE funding, Cosmas has been able to move to its own facilities. These facilities and equipment were required to develop the catalysis technology. Cosmas has also received an SBIR Phase I grant from the National Science Foundation and STTR Phase I and Phase II grants.

**Imagine...**



**A very simple  
process to custom  
produce and  
easily develop  
catalysts of high  
quality  
nanoparticles.**

**Lynn Astle  
1431 Oakcrest Lane  
Provo, Utah  
84604  
801-367-7085  
lynnastle@cosmas-inc.com**



# GlycoMira, LLC

## U N I V E R S I T Y   O F   U T A H

### DEFINITION OF COMPANY

GlycoMira, LLC, a development stage company formed in 2008, licensed from the University of Utah all rights to develop semi-synthetic glycosaminoglycan ether (SAGE) technology for treatment of anti-inflammatory diseases. GlycoMira is located at the University of Utah in laboratories in Research Park. SAGE products synthesized by GlycoMira demonstrate in animal models broad utility in blocking key inflammatory pathways and thereby show notable potential in a variety of human diseases. The company is developing SAGE technology for the treatment of dermal and ophthalmic uses, inflammation of the bladder (interstitial cystitis), gingivitis (inflammation of the gums leading to periodontitis) and cancer (metastasis of cancer cells).

### TECHNOLOGY

GlycoMira's technology is a unique family of anti-inflammatory products known as semi-synthetic glycosaminoglycan ethers, or SAGEs. SAGEs are sulfated polysaccharide compounds derived from naturally occurring hyaluronic acid (HA). SAGEs modulate inflammation in three ways. First, SAGEs inhibit cationic proteases of polymorphonuclear leukocytes, quelling inflammation. Second, SAGEs block P- and L-selectin, which are required for leukocyte migration into areas of inflammation. Third, and most importantly, SAGEs block activation of the receptor for advanced glycation end-products (RAGE). RAGE acts as a biological rheostat, amplifying immune and inflammatory responses.

### PROGRESS

GlycoMira has submitted and was awarded NIH grants, rented laboratory space in Research Park, hired scientific staff, initiated studies in animal models of inflammation, and began funding discussions with venture capital and angel investment groups. GlycoMira now has one issued patent and five pending applications. Specific achievements in advancing potential products include:

1. Active Pharmaceutical Ingredient (API) Production and Testing .
2. Treatment of bladder inflammation. There are limited options for physicians treating interstitial cystitis currently.
3. Expansion of IP portfolio. GlycoMira's submitted an accelerated patent for dermatology.

To permit further development of SAGE technology, GlycoMira entered into sublicense in April 2010 with Brickell Biotech, Inc (BBI). Under the terms of the agreement BBI will develop the dermatological and ophthalmic uses of SAGE products, and will share details of manufacturing, analysis, preclinical toxicology, and human safety and efficacy data with GlycoMira, which is actively developing other uses.

**Imagine...**



**A unique chemical process that yields drugs, that mimic the natural anti-inflammatory agent heparin, that are used in the treatment for inflammatory skin disorders.**

**G. Thomas Heath  
675 Arapeen Drive  
Ste. 302  
Salt Lake City, Utah  
84108-1257  
(801) 649-3999  
gtheath@gmail.com**

# Heavystone Laboratory, LLC

U N I V E R S I T Y   O F   U T A H

## DEFINITION OF COMPANY

Heavystone Laboratory, a Licensee of the Center for Functionally Graded and Designed Cemented Tungsten Carbide and Polycrystalline Diamond Composites, is a “technology company” founded upon breakthrough technology that dramatically improves the wear resistance of materials without sacrificing its impact resistance, and vice versa. This is achieved by using functionally graded cemented tungsten carbide. These materials have a multitude of applications in many manufacturing sectors including metal machining, mining, oil, gas, and geothermal energy explorations, and other industrial applications.

## TECHNOLOGY

Cemented tungsten carbide is an indispensable material for many manufacturing sectors of our economy. Compared to conventional homogeneous cemented tungsten carbide, functionally graded cemented tungsten carbide made using Heavystone Laboratory’s technology offers superior combinations of wear resistance, fracture toughness, and strength, and provides superior engineering performance. Therefore, these materials have the potential to drastically improve the durability and reliability of industrial tools that are currently made using conventional tungsten carbide materials and designed for metal machining, mining, oil, gas, and geothermal energy explorations, and other industrial applications where extreme wear resistance is required. A wide range of industries will see significant productivity improvements by employing the proposed process technology and the products developed using this process.

## PROGRESS

Heavystone Laboratory has formed industrial alliances and cooperative relationships with several international leading companies in the above industries to develop tool and products with superior performance in their perspective applications. These include Corporate R&D service contracts, NSF SBIR Phase 1 and Phase 1B grants, as well as Strategic Partnerships.

**Imagine...**



**A breakthrough technology that dramatically improves the wear resistance of materials without sacrificing its impact resistance.**

**Al Poskanzer/Zak Fang  
1782 West 2300 South  
Salt Lake City, Utah  
84119  
801-414-3251  
Al@poskanzer.com  
Zak.fang@utah.edu**

# iVeena, LLC

## DEFINITION OF COMPANY

iVeena, LLC, is an early-stage biotechnology company with the mission of developing novel proprietary drugs and drug delivery devices for treatment of the leading ocular diseases. iVeena's core technologies are licensed from the Corneal Research Laboratory of the Moran Eye Center, under the direction of Dr. Bala Ambati. iVeena will fundamentally change the way eye diseases are treated and improve the quality of life of more than 1 million people/year in the United States and potentially 3 million/year worldwide by preserving their vision with its line of Capsule Delivery Ring (CDR) products. iVeena, LLC, is developing a novel ocular drugs and drug delivery devices that takes advantage of lens capsule placement. Use of the iVeena "Capsule Delivery Ring (CDR)" device will increase patient comfort, compliance, and convenience and at the same time increase drug performance with improved sustained delivery.

## TECHNOLOGY

Designed as a result of Dr. Ambati realizing that the lens capsule has significant open space after a cataract removal and intraocular lens (IOL) implantation, the Capsule Delivery Device (CDR) was conceptualized and prototyped as a collaboration between the Corneal Research Laboratory and the Center for Biomedical Microfluidics both at the University of Utah. The CDR takes advantage of the extra space in the lens capsule of the eye. The CDR sits around the intraocular lens or "IOL". The long-term CDR is composed of a biocompatible material bonded to a permeable membrane which eludes the drug through the permeable membrane. Current studies have used Genentech's Avastin® drug. The mid-term bioerodable CDR is designed to dissolve over a predetermined treatment period, eluting the anti-inflammatory drug dexamethasone as the ring dissolves. A number of diseases may be treated with drugs delivered via the CDR, including:

- Age-Related Macular Degeneration (AMD)
- Glaucoma
- Diabetic retinopathy
- Retinitis pigmentosa
- Chronic Infection/Anti-Allergy

## PROGRESS

iVeena has seen significant progress, including conducting a pre-IND meeting with the FDA, as preparation for the initiation of a phase 1 or phase 2b human trial. iVeena has completed prototype animal testing on the first product and expects to commence GLP data collection within the next year.

U N I V E R S I T Y  
O F U T A H

## Imagine...



**CDR Schematic** shows the prototype CDR. The device will be guided into the lens capsule through a standard clear-corneal incision after cataract extraction. One-way check valves allow the reservoir to be refilled.

Greg Jones  
iVeena  
719 Sunny River Road #  
1213 Salt Lake City,  
Utah 84123-2820  
(801) 859-5149  
Greg.Jones@hsc.utah.edu



# JSK Therapeutics, Inc

U N I V E R S I T Y O F U T A H

## DEFINITION OF COMPANY

JSK Therapeutics, JSKT, is an early stage pharmaceutical company created to develop a new class of cancer treatment drugs which use glutathionylation (GLN) to kill cancer cells. GLN is a biochemical reaction between glutathione (a natural substance) and proteins. Certain key proteins required by cancer cells for growth are inactivated by glutathionylation, providing a new, highly potent means to treat a broad spectrum of cancers. The two JSKT scientific founders have identified and filed patents for GLN agents and associated drug formulation technology. The GLN agents constitute a drug pipeline with the first completing Phase I clinical trial and in a limited Phase II clinical trial. The second drug is in pre-clinical development and an IND will be filed first quarter of 2012.

## TECHNOLOGY

The first glutathionylation agent (Disulfiram and copper or zinc) is a specific combination and dosing mechanism of two orally delivered pharmaceuticals, Disulfiram and metal compounds such as Zinc or Copper. The initial targets for the Disulfiram metal combination are cancers involving the liver where the combination therapy has been demonstrated effective *in vitro*, in animals and in one human case.

The second agent (called JS-K) is a pro-drug that selectively delivers nitric oxide (NO) to cancer cells. NO is potentially cytotoxic to leukemia and solid tumor cells, however, because of NO's potential toxic effects, it has not been possible to use NO-generating compounds for cancer therapy. Unlike other compounds investigated, JS-K does not release NO spontaneously but activates the release of NO upon reaction with Glutathione S-Transferases (GST). GST's are found at significantly higher levels in cancer cells as compared to normal cells. The JS-K compound therefore exploits the upregulation of GST in cancer cells to selectively deliver a toxin (NO) to them.

## PROGRESS

A phase I trial, conducted at the Huntsman Cancer Research Institute, with Disulfiram and copper has been on going over the past year. A limited phase II trial, also at Huntsman Cancer Research Institute, using Disulfiram and zinc for relapsed/refractory melanoma was initiated in 2011 and is ongoing. Preclinical development of JS-K is underway, GMP manufacture of JS-K has been completed and development of the drug formulation is progressing. Preclinical toxicology studies should be completed in the first quarter of 2012 and an IND for JS-K ready for submission in the second quarter of 2012.

**Imagine...**

**Two new  
ways to  
treat all  
types of  
cancer.**

**Brent Edington  
85 Fort Douglas Blvd.  
Salt Lake City, UT 84113  
(801) 581-6310  
bedington@jskthera.com**

# NanoInjection Technologies, LLC

B R I G H A M   Y O U N G   U N I V E R S I T Y

## DEFINITION OF COMPANY

NanoInjection Technologies, LLC was formed for the express purpose of acquiring and developing technology which has come to be called “nanoinjection,” which was in early development at Brigham Young University (BYU) directed to new tools for making transgenic animals. Because this technology has the potential to replace the “microinjection” technology that has been in use for the past three decades, it is expected that development may be difficult, time consuming, and expensive. Our current focus is to identify those difficulties and identify solutions that will ultimately lead to development of one or more nanoinjection products.

## TECHNOLOGY

The company’s mission is to provide tools that make it easier to create transgenic animals – animals that contain a gene that has been introduced through a laboratory procedure. For the past thirty years, the conventional technique used to create a transgenic mouse has been to insert DNA into a pronucleus of a fertilized mouse egg (a zygote) prior to fusion of the two pronuclei to form the nucleus of a developing embryo, using a very thin glass “microinjector” pipette run by a highly skilled technician.

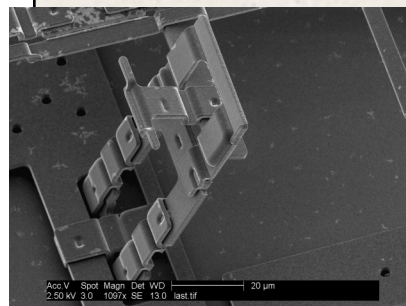
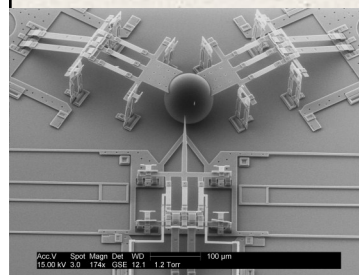
Not all DNA is suitable for microinjection and not all of the embryos so treated survive. The company is researching new ways to introduce DNA into a zygote. One product under research and development is an integrated nanoinjection device, which includes a movable lance and a cell restrainer. The lance is solid and very thin and handles the introduction of DNA very differently than a micropipette. At the outset, the lance is given a positive charge so that it will attract and hold the negatively charged phosphate backbone of the DNA that is to be inserted into a zygote. Once the DNA-carrying lance is inserted into a desired location, reversal of the charge from positive to negative will eject the DNA at the desired location. This strategy makes it less likely the zygote will be damaged and can deliver much larger lengths of DNA than can be passed through the small channel through a microinjection pipette.

## PROGRESS

The company continues to make progress in the very difficult process of making a transgenic animal. The BYU team has made and tested numerous different nanoinjectors in order to test mechanical features, electrical features, and features to test effects on the egg cells and DNA.

**Imagine...**

**A precision  
device to  
manipulate cells  
at the “nano”  
level.**



**David O. Seeley  
2825 E. Cottonwood  
Parkway, Suite 330  
Salt Lake City, UT 84121  
dseeley@  
nanoinjectiontech.com  
Phone: 801.683.9062**

# NeuroAdjuvants, Inc

U N I V E R S I T Y O F U T A H

## DEFINITION OF COMPANY

NeuroAdjuvants, Inc. (NAI) was formed in July 2005 to develop and commercialize novel therapeutics for the treatment of neurological disorders. The initial focus of NAI is to identify novel therapies for pain and epilepsy. NAI's proprietary technologies were developed at the University of Utah (U of U) by its scientific co-founders, Assistant Professor Grzegorz Bulaj, Ph.D., in the Department of Medicinal Chemistry, and Professor H. Steve White, Ph.D., from the Department of Pharmacology and Toxicology. These technologies have been exclusively licensed from the University of Utah by NAI.

## TECHNOLOGY

Drs. Bulaj and White have invented novel technologies that facilitate the movement of neuropeptides across the blood-brain-barrier (BBB) when administered systemically. Enhancing the pharmacological and pharmaceutical properties of peptide analogs to enable them to penetrate the BBB has been long sought by drug developers. Such an innovation would create a new powerful class of drugs to treat a wide range of central nervous system disorders (CNS). The Company has initially focused on modifying neuropeptides that have anticonvulsant activity when administered directly into the brain, but lack such properties following systemic delivery. The first neuropeptide that the Company has targeted is galanin, an endogenous neuropeptide in the central nervous system that has been recognized as a potential anticonvulsant agent but is limited by its marginal metabolic stability and inability to cross the BBB.

## PROGRESS

The prototype drug candidates that have been developed to date appear to be effective in animal models of CNS-based conditions including pain and epilepsy. In order to be an attractive drug development platform technology, NeuroAdjuvants needs to 1) definitively show its candidates cross the BBB in consistent, measurable, and dose dependent fashion and 2) demonstrate the utility of its technology in several neuropeptides to support a platform strategy. During the 2009-10 funding period, NAI advanced its platform and it appears that certain chemical modifications to the peptides under consideration may prevent their transit of the BBB. Should this prove to be true, a peripherally-acting drug platform could also arise from the NAI development program potentially enabling a second product family. The company has successfully applied for and received additional federal funding to further advance this technology.

**Imagine...**



**Novel  
therapies  
for pain and  
epilepsy.**

**Theodore H. Stanley**  
417 Wakara Way  
Suite 3111  
Salt Lake City, Utah  
84108  
801-581-6330  
teds@neuroadjuvants.com

# Sera Prognostics, Inc.

B R I G H A M   Y O U N G   U N I V E R S I T Y / U N I V E R S I T Y   O F  
U T A H

## DEFINITION OF COMPANY

Sera Prognostics is using a novel serum proteomics technology to identify and commercialize biomarkers from blood samples of pregnant women to predict those at risk for preterm birth (PTB), preeclampsia (PE) and other pregnancy complications. PTB and PE are both major healthcare problems, afflicting respectively almost 13% and 8% of pregnant women in the U.S. and world-wide. Adequate advance warning of women at risk for these complications would permit clinicians to administer a number of medical interventions to treat the mother and improve the outcome of the baby. Sera has identified a combination of proprietary peptide and well-studied protein markers for PTB that have a predictive level of 94% sensitivity and 85% specificity. Its top peptide markers for PE have a sensitivity of 96% and specificity of 100%. Validation testing with larger blood specimen sets is underway to confirm these results.

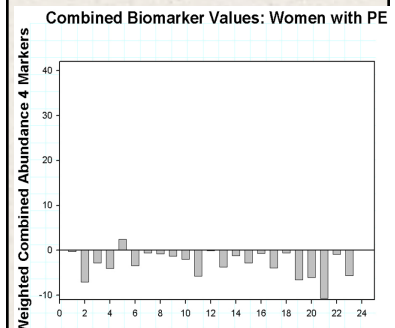
## TECHNOLOGY

Sera's first-of-kind serum proteomics approach couples capillary liquid chromatography (cLC) separation technology with electrospray ionization time-of-flight mass spectrometry (MS) to measure molecular mass. Non-informative proteins, which are in high abundance, are removed by a precipitation process. The proteomics platform can observe 4,000 to 5,000 different peptides, small proteins and other molecular species in a single blood specimen in real time. Using this powerful proteomics platform, Sera Prognostics is able to identify biological molecules that differ quantitatively between patients with a disease and those who have no medical complication.

## PROGRESS

Collaboration discussions are ongoing with a number of major partners for commercialization of these innovations in a "CLIA" lab. Tests developed and validated in CLIA labs are not currently subject to FDA approval. After initial market penetration by CLIA lab tests, FDA approved antibody test kits will be developed to greatly broaden the market by allowing for high throughput screening on automated immunoanalyzer equipment available at ~ 15,000 hospital and clinic labs throughout the country.

**Imagine...**



**A novel technology that identifies biomarkers from blood samples of pregnant women to predict those at risk for pre-term birth and other pregnancy complications.**

**Dennis B. Farrar**  
417 Wakara Way  
Suite 3111  
Salt Lake City, Utah  
84108  
801-585-6312  
denny@upstartvc.com



# SparkleCream, LLC

B R I G H A M   Y O U N G   U N I V E R S I T Y

## DEFINITION OF COMPANY

SparkleCream was established to commercialize a technology that carbonates frozen yogurt and other soft-serve dessert products. The company's focus is licensing and selling the hardware needed to carbonate the soft-serve product. The team has also developed a brand that accompanies the hardware. The hardware, and accompanying brand, will be licensed to yogurt stores, and other retail dessert operators as an additional novelty product to add incremental revenue to their operations.

## TECHNOLOGY

The technology to carbonate frozen yogurt was invented by Dr. Lynn Ogden at the BYU Food Science program and includes three patents. The first patent covers carbonating viscous foods. The second and third patents cover the actual hardware that is used to carbonate the soft-serve product. The hardware is simple to operate and attaches to a standard soft-serve ice cream machine. The carbonation process is most effective when either sealed, or when served "fresh" and the Sparkle Cream concept is to serve fresh, carbonated yogurt.

## PROGRESS

When the team initially licensed the technology, it was thought that the hardware was market-ready. However, as is common in university technologies, the hardware needed to be reengineered in order to be commercially viable in this market. We team completed the re-design of the hardware, and filed the third patent (through BYU). The company plans to have market-ready hardware by October 1, 2011.

The COE program has allowed the SparkleCream team to take an amazing idea and technology, one that already had significant amounts of money invested into it by the university, and actually take it to market. The COE program's funding was instrumental in this process.

**Imagine...**

**Frozen Yogurt  
that "sparkles"  
on your tongue!**



**Joel Clark  
PO Box 521938  
Salt Lake City, Utah  
84152  
801-328-4067  
[joel@kodiakcakes.com](mailto:joel@kodiakcakes.com)**



# Thermal Management Technologies, Inc.

## U T A H   S T A T E   U N I V E R S I T Y

### DEFINITION OF COMPANY

Thermal Management Technologies Inc. (TMT), a Licensee of the Center for Thermal Management Technologies specializes in solutions to thermal heating and cooling problems specific to the high tech requirements of space flight instrumentation and the demanding requirements of environmental impact mitigation requirements associated with oil and gas production. The current company focus is the development of isothermic structural modular panels sponsored by AFRL and the reclamation of contaminated oil field production water as sponsored by Purestream Technologies.

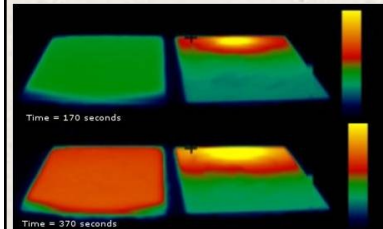
### TECHNOLOGY

Thermal Links, the original technology of TMT, continues to benefit the space programs associated with USU's Space Dynamics Lab and USURF. It is anticipated that this technology will be transferred by USURF to TMT before the end of 2010. Thermal Links and other space related technologies from TMT are expected to produce over \$1 MM in revenue in FY 2011. Improvements to Channel Panel, a technology that incorporates very robust heat spreading capability into structural panels, are now being funded by an AFRL SBIR and Channel Panel is expected to be utilized in satellite programs during 2011. Flow Meter and other technologies programs are still developmental. Functional engineering prototypes exist for these and environmental impact mitigation projects such as the vapor recompression "single well solution" sponsored by Purestream Technologies.

### PROGRESS

The company is organized and progressing with contracted work. TMT's engineering and business support staff is growing. Experienced and highly qualified people are joining the TMT team. Phase I and phase II SBIR contracts sponsored by Air Force Research Laboratory totaling \$810,000 have been secured. Excellent progress toward working prototypes is ongoing. Contracts for development of "single well solution" prototypes in the amount of \$420,000 from Purestream have also been secured and \$17,474 of sub-contract work was been performed during the contract period. Additional R&D funds provided to date from USURF provided by sponsors toward development of these and other technologies have totaled around \$363,722.

**Imagine...**



**Technologies for  
managing heat in  
very high  
performance  
situations**



**Ryan Beus**  
**1695 North Research**  
**Park Way**  
**North Logan, Utah**  
**84341**  
**435-797-4642**  
**information@tmtsd.com**

# Thermimage, Inc.

## U N I V E R S I T Y O F U T A H

### DEFINITION OF COMPANY

Thermimage is commercializing a medical device technology that meets the need for a safe and non-invasive means of diagnosing pediatric Vesicoureteral Reflux (VUR), a condition in which bladder urine flows backwards up into the ureters and into the kidneys, exposing the kidneys to infection and potential lifelong health problems. Although most have never heard of VUR, more than 2.5 million new cases of VUR are diagnosed annually, and over 10 million children are being treated for VUR at any one time. Medical "best practice" states that a child under 5 years of age that has a single urinary tract infection (UTI) should be tested for VUR - this practice is rarely followed by physicians today because of the traumatic process used to diagnose VUR. Thermimage's Thermflux Scanner™ is very novel and solves this problem by providing a non-invasive, comfortable diagnostic process that will replace the majority of invasive and traumatic VCUG's currently used to diagnose pediatric VUR. Thermimage recently doubled the market size of their technology focus by expanding the product line to include non-invasive brain temperature monitoring.

### TECHNOLOGY

The ThermoFlux Scanner™ will:

- Eliminate the majority of current invasive procedures
- Increase the detection rate
- Decrease untreated/undiagnosed cases of VUR
- Reduce the use of unnecessary antibiotics
- Prevent potentially devastating health consequences later in life

The AccuTemp Probe™ will provide a non-invasive, safe, reliable, comfortable, and cost effective means of monitoring deep tissue temperature in the body. The device will:

- Provide accurate internal temperatures of the brain or other organs during surgery and post-op
- Allow for decreased hospital stays by allowing temperatures to be returned to normal faster

### PROGRESS

The company is in final product testing prior to beginning regulatory filings for approval in the United States and Europe. In 2010, the company raised a Series A1 equity round and continues to be able to raise additional outside equity investment.

**Imagine...**



**Innovative  
medical devices  
that provide a  
safe and  
noninvasive way  
to detect  
pediatric VUR and  
deep tissue  
temperature  
monitoring.**

**Douglas G. Turnquist  
PO Box 27168  
Salt Lake City, Utah  
84127  
801-207-8281  
doug@thermimage.com**

# ViroPan, Inc.

## U N I V E R S I T Y O F U T A H

### DEFINITION OF COMPANY

For this grant, VIROPAN is developing “*Intracept*™,” a potent virus-inhibiting product (microbicide), based on a proprietary controlled-release formulation and vaginal *in situ* delivery system. *Intracept*™ is break-through advancement against HPV that prevents infection of a broad range of HPV types in sexually active women. The *Intracept*™ product takes advantage of both the intellectual property (IP) of VIROPAN, and an exclusive worldwide license to substantial IP from the University of Utah Research Foundation in the field of therapeutics and products for the prevention and treatment of sexually transmitted infections (STIs) in humans.

### TECHNOLOGY

ViroPan’s proprietary intravaginal ring (IVR) is a sustained-release system delivering one or more active agents. The ViroPan IVR is flexible and self-inserted intravaginally where it remains for a prolonged period of time (i.e., up to 30 days). This allows the woman to be protected at all times in a very unnoticeable manner. The Company is developing the only product, *Intracept*™, that delivers an anti-HPV agent.

### PROGRESS

ViroPan has successfully achieved all of the aims set forth in its application for the COE grant, namely:

- developed a slow release formulation of LCG that can be mounted in an IVR;
- evaluated the antiviral activity of LCG in vaginal fluids;
- developed an IVR prototype to deliver the formulation above;
- determined the loading versus release of the compounds;
- conducted additional mechanical and release studies of the compounds under specific conditions.

**Imagine...**

**A way for a woman to protect herself against certain sexually transmitted diseases in a non-intrusive manner.**



**Tyler McCabe, Ph.D.**  
7651 S 700 W, Ste 102  
Midvale UT 84047  
(801) 567-3787  
tmccabe@viropan.com



# Wastewater Compliance Systems, Inc.

## U N I V E R S I T Y O F U T A H

### DEFINITION OF COMPANY

Wastewater Compliance Systems, Inc (WCS), a Licensee of the Center for Water Treatment Technology at the University of Utah, is a company that sells a patented, submersible, igloo-shaped aeration product called Poo-Gloo™ that dramatically enhances the efficiency of wastewater lagoons. Our economical product is an easy-to-install retrofit solution for lagoon operators faced with compliance, cost, and capacity issues. The Company was formed in February, 2008, and profitably completed first year operations with commercial beta sites located at two Utah municipalities that were implemented with Centers of Excellence financial support.

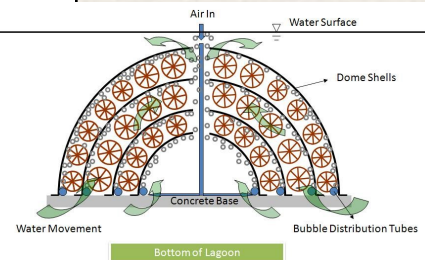
### TECHNOLOGY

Poo-Gloos increase efficiency and capacity of wastewater lagoons by providing a large surface area of aerated bio-film in a dark, warm environment. Biological conditions created within each Poo-Gloo promote growth of beneficial microbes that accelerate nutrient removal and enhance remediation. The Poo-Gloo is simple to install and appears deceptively simple. However, Poo-Gloos are a disruptive and energy efficient solution to a difficult problem in small and medium size cities and towns, as well as globally in developing countries and other areas where expensive, complex, hard to maintain conventional sewage treatment plants are not feasible.

### PROGRESS

WCS, Inc has been conducting scaled technology and product evaluations in test beds hosted in Salt Lake and Davis Counties. The tests are conducted in large tanks under controlled conditions using live municipal waste streams to evaluate product performance and to develop protocols to support commercial field activities. Second year 2009-10 CoE funds were combined with angel-seed investment to support the Company's effort to develop a national sales rep network; including launch of a revenue bearing pilot program to shorten sales cycles associated with new product regulatory acceptance in other states. WCS plans to achieve self-sustaining operations during 2011. The University of Utah conducts pure R&D activities for the company under mutually beneficial sponsored projects to investigate new scientific discoveries in lagoon wastewater treatment technology. WCS also contracts with UU to provide ongoing analytical lab testing and support services for our municipal test beds and commercial field sites. A first new patent has been filed, with more filings in process.

**Imagine...**



**A low cost  
aeration  
Solution to  
Increase the  
performance and  
capacity of  
wastewater  
lagoons.**



**Fred Jaeger  
PO Box 58065  
Salt Lake City, Utah  
84158  
801-647-0068  
fred@wcs-utah.com**

# Program Description

---

# PROGRAM DESCRIPTION

## Utah Centers of Excellence Program

2009-10

### “Our Job is Jobs”

**The purpose of the Centers of Excellence Program is to accelerate the commercialization of promising technologies that have strategic value for Utah. The end goal of the COE Program is to help drive economic development and job creation.**

The Centers of Excellence program is a State funded grant program to accelerate companies which license technology developed at Utah's colleges and universities and move the products to market more quickly. The process is a competitive annual selection process with grants of up to \$100,000 in the first year of participation and, in a second year, up to the remainder of \$500,000 total over two years of funding. The end goal of the COE Program is to help drive economic development and job creation.

Historically, the COE program provided funding to teams within Utah's colleges or universities. However, this often resulted in a significant gap in funding between the lab and the marketplace, often referred to as the “chasm of death”. In 2007, changes to the COE statute were enacted that permitted ongoing support of grants to companies which are Licensees of technologies developed at Utah's colleges and universities. 2008-09 was the first year that focused the program's funding on Licensee Grants and 2009-10 exclusively focused on Licensees.

The intent of COE grant funding is to help accelerate the process of taking these leading- edge technologies to market. Funding in this crucial gap helps companies mature the technology while they secure industry funding. Companies of any size are eligible to apply, including startups as well as existing, Utah-based companies which are planning to create a new product or product line from the licensed technology. The goal of these funds is to help defray the risk in taking these innovative new technologies to market in order to encourage more such licensing and the accompanying job creation that comes from exciting new market opportunities. The Centers of Excellence Program had a budget of \$2.5 million during the 2009-10 fiscal year.

The program received proposals from 28 companies which are licensees of a technology developed at one of Utah's colleges or universities. Requested funding totaled over \$5 million. Of the proposals received, 13 were in the category of Manufacturing, Materials, Energy and Environmental technologies, 12 were in the Life Sciences category, and 3 were from the Information Technology industry. The number of IT proposals was notably low, in past years the program received 12 or 13 IT proposals, or about 1/3 of total proposals. Of the total 28 proposals, 17 were new proposals to the program, and 11 were second year proposals, from Licensees which had received funding the prior year.

Of the 28 proposals, 13 were awarded funding totaling \$2.46 million. Of this funding approximately \$2.158 million was awarded directly to the companies and \$301, 000 was sub-contracted to a university to advance research in support of the company. These partnerships, made at the

request of the proposing company, were to help smooth the transitions of these advanced technologies out of the lab and into industry.

All Licensees are required to provide a 1:1 match from either industry or Federal sources, and, when a sub-contract is provided, teams from universities that grant doctoral degrees must provide 2:1 matching funds. A 1:1 match is required for all other institutions.

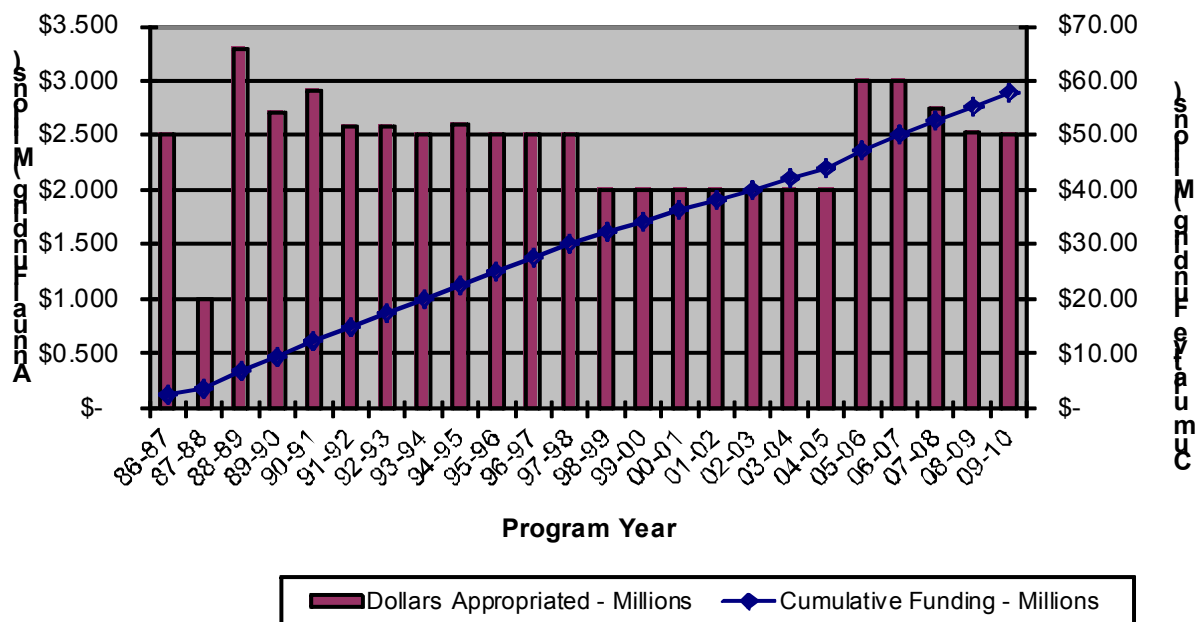
Of the 13 teams awarded funding, all 13 properly executed their contracts. This was a very difficult year to raise matching funds due to the ongoing recessionary economy. Unlike in previous years, companies submitted multiple invoices during the year to claim portions of their matching funds, as they “dribbled” in. Only a few teams used investor funding (equity) as their match, most used either sub-licensing agreements or Federal SBIR or STTR funds to serve as their match for the COE funding.

Of the 13 Licensees, 12 received full matching funds, and thus a full disbursement, of their funds. Of these, more than half required a short contract extension (of 6 months or less) in order to finalize their matching funds. Because of the tremendously difficult economy, these extensions seemed prudent. The final licensee received partial funding.

## HISTORICAL FUNDING

This graph shows the history of funding for the COE program

**Centers of Excellence Funding 1986-2010**





## **2009-10 CENTER SELECTION PROCESS**

The 2009-10 Centers of Excellence solicitation was issued in the first quarter of 2009 with a proposal deadline of Tuesday June 30, 2009. The review process was conducted in July and awardees were announced August 5, 2009. The review process includes an in-person presentation by the proposing team in front of members of the Centers of Excellence Advisory Council, who are volunteer experts from Utah's technology business community.

The 2009-10 proposal included gathering a lot of information about the company, technology, backers, aimed at helping the COE Advisory Council gauge the commitment of the company founders/leaders to the technology and the potential for job creation success of the venture.

The COE Advisory Council is a group of seasoned technology industry executives, CEOs and CTOs, VPs and Senior Directors, who are interested in helping Utah and the Centers of Excellence Program succeed. This year there were 19 volunteer reviewers on the Advisory Council, 4 of them new to the program for 2009-10. For the 2009-10 selection year, the COE Advisory Council conducted 28 reviews of Licensee Grant proposals. The funding requests this year were in excess of \$5million.

During the selection process, building on successful changes in 2008-09, each proposal was assigned to one of three categories. These categories are:

- Materials / Manufacturing / Environmental / Energy
- Information Technology / Communications / Aerospace/Defense / Electronics/Electrical Devices
- Life Sciences

Each category was assigned a day of meetings for our Reviewers. Each proposing team was then assigned a roughly 30 minutes time slot in the morning. For the first half of the day, the sub-committee members of the Advisory Council listened to back-to-back proposal presentations by the proposing teams. After all of the teams had presented to 2-4 Advisory Council members, the sub-committee as a whole sat down together for the first phase review and prioritization.

During this process, the sub-committee members discussed each proposal, evaluated the proposed funding request, and made the initial recommendations for funding and amount of funding. Each proposal that was recommended for funding also received a score on a scale of 0-5 (5 is high score). The average of the reviewers' score was assigned to the proposal, and then each sub-committee's selections were ranked by score. This process narrowed the field of proposals from 28 down to 15 which were considered by the full Advisory Council. 6 proposals from the MMEE sub-committee, 1 proposal from the IT sub-committee and 8 from the Life Sciences sub-committee were forwarded to the full committee for review.

On July 22, 2009 the full COE Advisory Council met as a group to review the 15 proposals forwarded from the sub-committees. Of the 15 considered, 13 were recommended for funding for 2009-10.

During the final review process, the members of the Advisory Council in attendance either accepted the committee's recommendation, or modified the recommendation. All recommenda-

tions must be accepted by a majority vote, and the process of discussion and recommendation continued until a majority vote was reached for each proposal. Each recommendation included whether or not the proposed application was recommended for funding, and the amount of funding recommended for the Licensee and, if requested by the proposing team, the amount of funding recommended to be contracted back to the university team.

The summary of the awards is as follows:

**Total Proposals – 28 Submitted – 13 Awarded Funding:**

**12 Second Year Submissions– 8 Awarded funding**

**16 First Year Submissions - 5 Awarded funding**

**BYU – 4 Awarded Funding (9 Submitted)**

**USU – 1 Awarded Funding (2 Submitted)**

**UU – 8 Awarded Funding (16 Submitted)**

**CEU – 0 Awarded Funding (1 Submitted)**

Proposals by Track

MMEE - 13

LS – 12

IT – 3

The total budget of awards was \$2.46 million, with \$2.121 million awarded to Licensees (companies) and \$339,000 awarded to universities to do work on behalf of and in conjunction with licensees.

This was the second year that the “speedpitch” process was used, combined with the ongoing sub-committee approach. All feedback on this updated approach was that it continued to be very successful. It provided enough time for the proposing teams to communicate their technology and their business plan and strategy, while allowing the Council members to see a wider array of the proposing teams and also to prioritize them within areas of expertise before the final Council meeting.

The key requirements for funding this year included: The potential for a technology to create a significant Utah employer, whether the proposing team or management team was credible to accomplish the needed commercialization activities, and for teams already in the program, whether the program was “on track” and meeting key milestones. Unlike in past years, no funding was allocated to business teams or consultants. During the 2009-10 year, the plan was to focus funding on entrepreneurs and their companies.

On a sad note, Dr. Gerald Sharp, of Salt Lake City, Utah, a long time and valued member of the Centers of Excellence Advisory Council, passed away on May 22, 2009. Barely a month earlier, April 16, 2009, Gerry had served the State on the COE Advisory Council in the 2008-09 Part B review, sharing his expertise and experience. Dr. Sharp will be missed by the COE program and by his colleagues on the COE Advisory Council and was honored with a minute of silence at the July final meeting.

# 2009-2010 Financial Summary

---

The Financial Summary is a summary of the information provided by each Center in their annual report to the program and the funding summary is based on the funds granted during the fiscal year. For reference, “Total Funding” means COE funding awarded since starting with the program, “Patents Pend...” means patents newly filed during the fiscal year, “New Patents (Issued)” refers to those issued during the fiscal year and “Licensees” refers to companies which licensed the technology from a former Center of Excellence, while those marked “N” are Licensees of other university developed technology..

<b>University</b>	<b>Funded Companies</b>	<b>09-10 Funding</b>	<b>Total Funding</b>	<b>Total Dis- bursed</b>	<b>09-10 Matching</b>	<b>Patents Pend. 09-10</b>	<b>New Patents (Issued)</b>	<b>Spin-Offs/ Licensees</b>
<b>BYU</b>	Cosmas, Inc.	200.000	375.000	37500	250,000	NA	NA	Y
<b>UU</b>	GlycoMira, LLC	325.000	500.000	371.427	196.427	NA	NA	N
<b>UU</b>	Heavystone Laboratory, LLC	120,000	120,000	120,000	90,000	NA	NA	Y
<b>UU</b>	iVeena, LLC	100.000	100.000	100.000	100.000	NA	NA	N
<b>UU</b>	JSK Therapeutics	100.000	100.000	100.000	100.000	NA	NA	N
<b>BYU</b>	NanoInjection Technologies, LLC	100.000	100.000	100.000	100.000	NA	NA	N
<b>UU</b>	NeuroAdjuvants, Inc.	300.000	500.000	450.300	250.300	NA	NA	N
<b>BYU/UU</b>	Sera Prognostics, Inc.	300.000	400.000	400.000	300.000	NA	NA	N
<b>BYU</b>	Sparkle Cream, LLC	100,000	100,000	100.000	100.000	NA	NA	N
<b>USU</b>	Thermal Management Technologies, Inc.	95,000	195,000	195,000	95,000	NA	NA	Y
<b>UU</b>	Thermimage, Inc.	300,000	500,000	500,000	300,000	NA	NA	N
<b>UU</b>	Wastewater Compliance Systems, Inc.	300,000	500,000	500,000	300,000	NA	NA	Y
<b>UU</b>	ViroPan, Inc.	100,000	100,000	100,000	100,000	NA	NA	N

If a company which received funding is a spin-off or licensee of a former University Center of Excellence, then it is marked as “Yes”. If the company is a university licensee of a technology that was not supported by the COE program in previous years, it is marked as “No”.

# 2010-2011 Funded Centers

---

## **Funding Recipients for the 2010-11 Centers of Excellence Program (Review 1)**

**Total proposals submitted: 45**

**Total awarded funding: 21**

**12 Licensees,**

**5 affiliates,**

**2 internal UU teams**

**2 USU internal teams**

**The technologies are emerging from the following universities:**

**5 from BYU**

**11 from UU**

**5 from USU**

### **LICENSEES**

**Anaerobic Digestion Technologies, Inc.**

**CEO/Principal:** Jason Miller

**Affiliate/Licensee/Univ.:** Licensee

**Award Amt.:** \$40,000 – Company

**Univ.:** BYU

**Cluster:** LS

A patent-pending, low-cost, low-maintenance, scalable methane filtration solution. The system is comprised of multiple filter cylinders and gas routing hardware, with an automated electronic control system. The BCS is skid-mounted for easy delivery and installation. The System removes corrosive contaminants and impurities from well-produced and waste-generated methane gas streams at 1/10th to 1/15th the cost of currently marketed technologies. Hydrogen sulfide, water, and other destructive agents are extracted to negligible levels by the BCS, significantly prolonging the life of pipeline infrastructure and electrical generation equipment associated with gas resources. Ground-breaking innovation is manifest in the thermal management system of the BCS. Low levels of excess system heat are utilized to replenish the filter beds and release contaminants in a concentrated gas stream. Successful management of this process makes the system unique and industry-changing in character.

**Aviradyne Technologies, Inc.**

**CEO/Principal:** Ronald D. Jones

**Affiliate/Licensee/Univ.:** Licensee

**Award Amt.:** \$40,000 – Univ

**Univ.:** USU

**Cluster:** MMEE

Hybrid rockets are significantly safer than Liquid and Solid counterparts. Hybrid motors can be stored and operated without risk of explosion. This makes hybrids ideal for commercial spaceflight except for two significant short-comings attributable to current manufacturing processes: motor-to-motor variability that precludes motor clustering, and lack of a for volume production method to support the required flight rates for the growing commercial space launch industry. The proposed production method uses robotic manufacturing technologies to effectively remedy both of these deficiencies: Digital-Direct Manufacturing to fabricate hybrid rocket fuel grains that are uniformly produced, and Filament/Tape Winding systems to form the composite case and assemble the motor in a single process. Factory automation and application of advanced polymer materials will significantly reduce motor-to-motor performance variability, enable FAA certification, and cut production costs by more than 50%.

**Black Box Engineering, Inc.****CEO/Principal:** Zac Humes**Affiliate/Licensee/Univ.:** Licensee**Award Amt.:** \$40,000 – Company**Univ.:** USU**Cluster:** MMEE

Coanda Assisted Spray Manipulator (CSM) gives the user the ability to change the direction of the flow of flame and particles leaving existing flame spray guns. The CSM will be designed as an add-on to existing flame spray gun technology. These flame spray guns are used for coating the interior of pipes, cylinders, and other surfaces using different materials. The coatings are used to improve performance of the substrate and reduce maintenance costs. Current technology limits this process to being performed on large diameter pipes, usually greater than 48 inches in diameter, because it requires a person to be inside the pipe to control the direction of the flow. The CSM device will allow the process to be completed on smaller diameter pipes and surfaces without the need for human labor to control the direction of the flow. This process will also be completed more quickly, accurately, and affordably as it removes the need for such intensive manual labor as is currently necessary.

**CAT-Credibility Assessment Technologies****CEO/Principal:** Donald R. Sanborn**Affiliate/Licensee/Univ.:** Licensee**Award Amt.:** \$40,000 – Company**Univ.:** UU**Cluster:** IT

Oculomotor Deception Detection© (ODD) holds significant promise for numerous security screening and intelligence applications. This revolutionary technology, based on five years of scientific research, provides a powerful new methodology for detecting deception. The ODD measures cognitive responses to deception as detected by a highly accurate eye tracking system that records eye movements and pupil diameter changes as a subject reads true/false questions presented by a computer. The current standard for lie detection technology is the polygraph which takes up to 3 hours to administer, requires a highly skilled examiner, costs about \$970 and is 85% accurate. The ODD test takes only 25 minutes, is easily-administered by minimally trained examiners and costs a fraction of the polygraph with the same accuracy.

**Crocker Spinal Technologies****CEO/Principal:** David Hawkes**Affiliate/Licensee/Univ.:** Licensee**Award Amt.:** \$40,000 - Univ.**Univ.:** BYU**Cluster:** LS

The FlexSuRe™ is a spinal implant developed at BYU and licensed by Crocker Spinal Technologies, Inc. The FlexSuRe™ was designed to restore stability to the spine after surgeries such as discectomy or laminectomy. It shares load with other spinal structures, maintaining healthy motion while providing mechanical resistance to painful, nonphysiologic motion. The existing FlexSuRe™ is already market-separated due to its unique compliant-mechanism design. However, based on recommendations by the surgeon advisor board advising Crocker Spinal Technologies, the implant can be improved to increase its market acceptance. The COE award will be used to change the existing design to decrease size, modify orientation, and restore height to the segment. As a result, the device will restore nutrient flow to the disc while biomechanically mimicking the motion of a healthy segment. These characteristics make the device forward-looking to complementary technologies for spinal disc regeneration.

**E-Sens (Formerly Sensicore China)****CEO/Principal:** Jack Buchanan**Affiliate/Licensee/Univ.:** Licensee**Award Amt.:** \$40,000 – Company**Univ.:** UU**Cluster:** MMEE

Sensicore has developed a silicon-based chemical sensing technology to address the world's water monitoring needs. The company's lab-on-a-chip sensors monitor multiple chemicals with an array of sensors selective to different analytes. The sensor array takes advantage of the mass fabrication manufacturing technology of the semiconductor industry to produce a low cost per test solution. The sensor array chip will be replaced periodically, eliminating the need for constant maintenance of the sensors. Its small size reduces the need for calibration solution, making it practical to produce small hand-held sensing systems, and to implement remote, unattended sensor network nodes.

**HOT Water Global****CEO/Principal:** Brandon Lloyd**Affiliate/Licensee/Univ.:** Licensee**Award Amt.:** \$40,000 – Univ**Univ.:** UU**Cluster:** MMEE

This new technology involves repeated pressure cycles each consisting of a compression stage and a venting stage. The compression stage reaches 100-150 psi in the headspace of a closed vessel by use of a compressor, saturating the water being treated with an ozone/air mixture. The venting stage (to ambient pressure) produces rapidly expanding gas bubbles of all sizes from nano, micro, and centimeter sizes that provide abundant reactive interfacial ozone for ozone and contaminants. Repeated pressure cycles result in conversion of dispersed and dissolved oil into forms that can be removed by conventional sand filtration or biodegradable products. This project will use a pilot reactor (200 L) to demonstrate treatment of produced water and flow-back water from the oil and gas industry. The process represents an application of University Technology (U-3996).

**Microsurgical Innovations****CEO/Principal:** Jay Agarwal**Affiliate/Licensee/Univ.:** Licensee**Award Amt.:** \$20,000 – Company; \$20,000 – Univ.**Univ.:** UU**Cluster:** LS

An arterial anastomotic device, referred to as an arterial coupling device (ACD), which will replace the hand suturing technique currently used to connect arteries in microsurgery and macrovascular end-to-end arterial repair surgeries. This device would consist of a barbed cap that would be placed at the end of each artery and then connected together to attach the two arterial ends. This approach would reduce the time required in the surgery suite, reduce costs associated with surgery, and reduce the likelihood of failure of the anastomoses, by minimizing human error and stenting open the anastomosis. There are currently no arterial anastomotic devices available. This technology has the ability to simplify technically challenging microvascular repair and to expand the scope of microsurgery by facilitating these types of procedures in third world countries and in battlefield hospital settings.



**TranquilMed****CEO/Principal:** Jared Edgel**Affiliate/Licensee/Univ.:** Licensee**Award Amt.:** \$40,000 - Company**Univ.:** BYU**Cluster:** LS

RestEasy will be the only non-drug treatment for Restless Legs Syndrome (RLS) on the market. It uses patent pending treatment of near-infrared light that penetrates the skin deep into the tissue. Dr Mitchell's studies show 52% reduction in RLS symptoms in 12 treatments and give a p-value less than 0.001. Our device consists of a neoprene pad with adjustable straps. The back of the pad has an array of LEDs that when applied to the lower leg emits near-infrared light that penetrates the skin. This releases Nitric Oxide which then causes the blood vessels to dilate. Vasodilation in turn increases blood flow, satisfying the urge to move and mitigating RLS symptoms. Features for safe home-use and convenience include: a lithium-ion battery that allows free movement during treatment and a control interface that is simple to use. Additionally the device has thermocouples in place to shut the device down if the temperature of the leg gets too high.

**Solan LLC****CEO/Principal:** Brandon Lloyd**Affiliate/Licensee/Univ.:** Licensee**Award Amt.:** \$40,000 – Univ**Univ.:** UU**Cluster:** MMEE

A technology that will fabricate solar cells based on lithographically defined graphite, so-called carbon nanoribbons (CNRs). The electronic properties of CNRs exhibit a dependence on the ribbon dimension. Reducing ribbon width to nanometer scale can turn graphite into a semiconductor, and with the proper selection of metal contacts with different work functions ( $\phi$ ), one can form Schottky barrier solar cells. Upon excitation of the incident light, free electrons and holes will be generated within CNRs. Due to device building-in potential, which equals to the difference in  $\phi$  between the two metal leads, free electrons and holes will be extracted to the electrodes, generating electricity. Due to the abundance of graphite material and convenience to tune the material bandgap, we expect to fabricate low-cost and high-efficiency solar cells. A patent, filed on this invention jointly by University of Utah and University of Wisconsin-Madison, has been allowed and licensed to Solan.

**Veritract, LLC****CEO/Principal:** Arlo McGinn**Affiliate/Licensee/Univ.:** Licensee**Award Amt.:** \$40,000 - Company**Univ.:** UU**Cluster:** LS

Nasogastric feeding tubes are the most commonly placed gastrointestinal devices in hospitals today. Over 80% of ICU patients and many more patients in general hospital floors (1.25 million total US patients) receive nutrition via these tubes. Because most of these feeding tubes are placed blindly, without any guidance, many thousands of these tubes are misplaced to the lung causing serious injury and even death. To verify proper placement, most hospitals require X-ray confirmation of tube placement but incur significant extra expense as a result.

Veritract leverages the advancements made in endoscopic technology to allow these technologies to be built into an inexpensive disposable device. Our design integrates optics for vision, and steering for guidance, allowing feeding tubes to be guided and placed into the intestinal tract under direct visualization. This allows for a much quicker, safer, and economical placement and improves patient care while streamlining hospital procedures.

## **2010-11 (R1) AFFILIATE COMPANIES**

### **Cajun Archery**

**CEO/Principal:** David White

**Affiliate/Licensee/Univ.:** Affiliate

**Award Amt.:** \$12,500 – Univ.

**Univ.:** USU

**Cluster:** MMEE

Through a market analysis, Cajun Archery, a manufacturer and supplier of bowfishing equipment, has identified a need for a bowfishing reel. Currently, there are two bowfishing reels that dominate the bowfishing market. One of these reels releases line very efficiently, while the other retrieves line well. Neither reel excels at performing both of these tasks. This project is to design a bowfishing reel that is able to both release and retrieve line efficiently, is easy to operate, requires minimal maintenance, and is cost effective to manufacture. Through the use of computer-aided design (CAD) rapid prototyping, and computer numerical control (CNC) machining the Research Group for Product Engineering and Prototyping at USU is able to quickly design, test and develop products to meet market demands. Through the engineering design process we will be able to meet design criteria and reduce commercialization risks for Cajun Archery.

### **Domain Surgical, Inc.**

**CEO/Principal:** David J. McNally

**Affiliate/Licensee/Univ.:** Affiliate

**Award Amt.:** \$40,000 – Company

**Univ.:** UU

**Cluster:** LS

Surgery requires the cutting and coagulation of bleeding tissues and vessels, as well as the re-attachment of tissues or their destruction. Because of this, a large market has evolved based upon the promise of improved outcomes related to the excision, dissection, hemostasis, and healing of tissue. Many innovations have been introduced in recent years, but many surgeons are still dissatisfied that there is not a tool that meets all the criteria. Our patent-pending ferromagnetic inductive heating technology holds the promise of producing surface-only tissue effects with energy that does not pass through the patient; frictionless cutting with elimination of tissue distortion and sticking; on-demand rapid onset and offset of effect as various tissues or bleeding are encountered; and easy cleaning and disposability. These attributes position our technology as an ideal energy modality for cardiothoracic surgical procedures.

### **Enerlyte, LLC**

**CEO/Principal:** Seth M Phillips

**Affiliate/Licensee/Univ.:** Affiliate

**Award Amt.:** \$40,000 - Univ

**Univ.:** BYU

**Cluster:** MMEE or IT

Enerlyte's intelligent, clean technology, energy conservation program is a revolutionary web-based software for tracking energy efficiency & conservation. The software tracks both user activity and results of utility conservation programs. Using system data, Enerlyte software makes recommendations to users and utilities for improving energy usage. Users get graphs and customized tips on their monthly utility bill. Utilities get an online dashboard providing usage analysis that maximizes utility ROI for each dollar spent on efficiency & conservation. Enerlyte groups users into peer groups (households with similar size/age of home, family size, location, etc.) and monitors changes in energy use when users take specific actions to conserve. Enerlyte's product uniquely addresses both user & utility demand for energy usage information that can lead to improved efficiencies in energy usage & conservation.

**Euclid Timber Frames LLC****CEO/Principal:** Kip Apostol**Affiliate/Licensee/Univ.:** Affiliate**Award Amt.:** \$7,500 – Company; \$7,500 – Univ.**Univ.:** UU**Cluster:** MMEE

Interlocking Cross Laminated Timber (ICLT) is a prefabricated cross-laminated solid wood wall and roof panel fabricated from 2-5 layers of alternating direction 3" x 6" to 3" x 8" pine stock milled from beetle kill trees. ICLT utilizes no fasteners and no adhesives, removing the reliance on volatile organic compound (toxic) adhesives, allowing the panel to be disassembled at end of life to be repurposed in the building material supply chain. Layering gives the panel strength, allowing low-grade wood to be used in a high value structural situation, estimated to last upwards of 100 years. ICLT can be built up to nine stories in some cases, efficient in speed of construction, and given the availability of material, potentially affordable for both production home building and large commercial structures. This proposal is for ICLT commercialization research between university and industry in preparation for market acceptance in the next two years.

**Fusion Diagnostics****CEO/Principal:** Ben Rollins**Affiliate/Licensee/Univ.:** Affiliate**Award Amt.:** \$40,000 – Company**Univ.:** UU**Cluster:** LS

Developing glasses with a novel coating that blocks the light spectrum that triggers migraines and other neurological disorders such as blepharospasm. By wearing these coated glasses, migraine sufferers may experience significant reduction in the frequency and severity of their migraine attacks. These coatings can be applied to spectacle lenses, contact lenses, and various types of light sources.

**Linear Signal, LLC****CEO/Principal:** Greg Mockett**Affiliate/Licensee/Univ.:** Affiliate**Award Amt.:** \$40,000 – Univ.**Univ.:** BYU**Cluster:** IT

Traditional satellite dish antenna technology suffers from quality of service problems due to poor mount installation, wind loading, rain, roof sag, and satellite orbital wobble. Smart electronically steered phased array feed antennas adjust the antenna beam adaptively to maintain maximum signal quality. Linear Signal has developed a critical enabling part for smart antennas, an integrated beamformer chip, which will be combined with high efficiency, low noise phased array antenna technology developed for radio astronomy by Prof. Warnick at BYU to produce smart antenna feeds for commercial satellite antennas on buildings, aircraft, vehicles, and ships.

## **2010-11 (R1) UNIVERSITIES**

### **Large-Scale Semiconductor Nanocrystal Fabrication**

**CEO/Principal:** Michael H. Bartl

**Affiliate/Licensee/Univ.:** UU

**Award Amt.:** \$40,000 – Univ

**Univ.:** UU

**Cluster:** MMEE or IT

Nanocrystals (1 to 100 nm in size) are considered cornerstones of emerging energy, information, and biomedical technologies due to their unique size-dependent electronic and optical properties. However, their widespread use is severely limited by current high-cost and small-scale fabrication methods requiring high temperatures. In contrast to existing techniques, we have developed a novel synthesis method for high-quality nanocrystals that operates at low reaction temperatures (patents pending). Our method promises enormous impact for commercial applications, since low-temperature synthesis enables easier scale-up (high throughput fabrication) with reduced engineering requirements while keeping high product quality and reproducibility. Moreover, our method uses inexpensive, industry-tested and reusable reaction components (e.g. solvents) and therefore should not only result in significantly reduced manufacturing costs, but also in environmentally-friendlier "greener" fabrication.

### **Smart Antenna Technology**

**CEO/Principal:** Bedri A. Cetiner

**Affiliate/Licensee/Univ.:** USU

**Award Amt.:** \$40,000 – Univ

**Univ.:** USU

**Cluster:** IT

The technology developed at USU is an adaptive smart antenna technology that enables a single antenna element to dynamically change its properties such as operation frequency, beam direction, and polarization. An adaptive antenna is an indispensable part of the next generation wireless communications systems such as upcoming 4G systems in order to achieve targeted system performances, i.e., higher data rate, capacity, etc. With the existing technologies for a system to provide dynamically adaptive features, a large number of antennas in conjunction with ancillary electronic components need to be used. The existing technology, therefore, is cost and size prohibitive for commercial wireless systems. On the other hand, our technology provides a superior performance with a single antenna element which can be realized at low cost and size. The microfabrication technology developed by the PI's research group, which will be patented by the USU TCO, is based on a novel microfluidic technology

### **Smart Occupancy**

**CEO/Principal:** Aravind Dasu

**Affiliate/Licensee/Univ.:** USU

**Award Amt.:** \$40,000 – Univ

**Univ.:** USU

**Cluster:** IT

The Smart Occupancy Sensor is a dual mode hardware device (Passive IR + Video camera) that can be mounted on a ceiling in an office room, and expected to reliably and near-instantaneously turn lights on when occupied and turn them off when unoccupied. The unique features are: (a) Its response time is ~5 seconds compared to 15-20 minutes for motion sensors, (b) It can be configured and setup via software using a graphical user interface, (c) It does not suffer the infamous 'hand waving' problem that motion sensors do, and (d) It can be upgraded via software updates for daylight aware lighting control and task control.

**Trace Explosives Detection****CEO/Principal:** Ling Zang**Affiliate/Licensee/Univ.:** UU**Award Amt.:** \$40,000 - Univ**Univ.:** UU**Cluster:** MMEE

Portable devices that are suited for infield explosives detection. The sensory materials are composed of well-defined nanofibers fabricated from different building-block molecules. As covered in our five IPs, the nanofibers are highly efficient for vapor detection of explosives, via optoelectronic modulation upon interaction with the targeted explosives. Upon integration into a small chip, the entangled nanofibers form a mesh-like, highly porous film, providing maximal sampling of explosives, enabling expedient vapor detection with unprecedented efficiency (down to ppt range). This is superior to the common solid film-based sensory materials, for which the sampling of trace analysts remains difficult due to the limited surface area. Compared to conventional electronic detection systems like those based on MS or IMS, the nanofibers represent a class of simple, small and adaptable detection system.

# **Funding Recipients for the 2010-11 Centers of Excellence Program / Technology Commercialization and Innovation Program (Review 2)**

**As of March 2011, the Utah Legislature changed the name of the Centers of Excellence Program (COE) to the Technology Commercialization & Innovation Program (TCIP). Review 2 was conducted under the new name.**

**Total proposals reviewed: 42**

**Total recommended for funding: 22**

**Licensees: 14**

**Affiliates: 5**

**UU Internal teams: 2**

**USU internal teams: 1**

**The technologies are emerging from the following universities:**

**12 of 22 from UU**

**5 of 7 from BYU**

**3 of 9 from USU**

**1 of 2 from SLCC**

**1 of 1 from UVU**

**0 of 1 from WSU**

## **FUNDED**

### **Aciont**

**CEO/Principal: John Higuchi**

**Affiliate/Licensee/Univ.: Licensee**

**Univ.: UU**

**Cluster: LS**

The project is a preclinical proof of concept research plan as a premise to create the ultimate achievement in ophthalmic therapy: to treat non-invasively, age related macular degeneration (AMD) and diabetic retinopathy. The project intends to develop a safe and an effective, an approximate 20 minute iontophoresis treatment for the delivery of macromolecules such as Avastin® to the posterior section of the eye, which can be administered by a nurse or paraprofessional or potentially, patients themselves. This Visulex® system is a combination novel ocular iontophoresis device - an eye applicator resembling a scleral lens - and enhancement formulation capable of delivering large, antibody agents to the posterior segment of the eye. Iontophoresis is a method of delivering drugs through body tissue using the aid of a mild electrical current. Visulex offers a customized, localized controlled release therapy designed to minimize unnecessary patient exposure to the drug.

**Akadi Technologies**

**CEO/Principal:** Wes Christiansen  
**Affiliate/Licensee/Univ.:** Licensee

**Univ.:** UU  
**Cluster:** IT

Akadi digital signage is unique in that it creates a network of displays, organized by time, geographic location and demographic audience which can be managed by any user from any web enabled device. Value in the network increases as the reach of the network grows, enabling advertisers and diverse interest groups to target unique audiences with specific and relevant information. For advertisers to be successful today they have to stand out! Success in business today is less about advertising and more about connecting through social media, viral messaging and other meaningful interactions. Targeted messaging and information that is personalized and relevant is the only way to reach through the clutter of messages we are bombarded with on a daily basis. Akadi Technologies is perfectly positioned to be able to leverage a number of technologies, existing and currently under development, to redefine digital signage and targeted and interactive messaging.

**AnalySwift**

**CEO/Principal:** Allan Wood  
**Affiliate/Licensee/Univ.:** Licensee

**Univ.:** USU  
**Cluster:** MMEE/IT

VABS is a unique technology capable of rigorously modeling 3D slender solids with complex microstructures, such as wind turbine blades, helicopter rotor blades, bridges, and other beam-shaped structures. VABS has been consistently demonstrated to be much better than other technologies regarding accuracy, efficiency, and versatility. This technology can save several orders of magnitude in computing time with little loss of accuracy and is gaining an international reputation in rotorcraft and wind power industries. Major companies such as Boeing, Siemens, AeroVironment have licensed VABS. All the other competitive technologies have a very limited set of capabilities and few of them can treat composites which are extensively used now. Furthermore, none of the existing tools have a strong endorsement from the research-oriented community as VABS has. We strongly believe that VABS will become a very competitive product and the tool of choice for modeling composite beam structures.

**Credibility Assessment Technologies**

**CEO/Principal:** Donald R. Sanborn  
**Affiliate/Licensee/Univ.:** Licensee

**Univ.:** UU  
**Cluster:** IT

Ocular-motor Deception Test (ODT) is the first major breakthrough in deception detection technology in 20 years, with numerous security screening and intelligence applications. This revolutionary technology provides a powerful new methodology for detecting deception. The ODT measures cognitive consequences of deception with a highly sensitive eye tracking system that records eye movements and pupil diameter changes as the subject reads true/false questions presented by a computer. The ODT compared with other technologies like the polygraph, it is more competitive: It is easily-administered, takes only 25 minutes, is cost effective, achieves the same accuracy (85%), can be administered in multiple languages and settings, facilitates high volume testing, and is customizable to different needs. In conclusion, the ODT reduces the need for time-consuming and expensive polygraph examinations and brings simplicity, speed, and convenience to screening process.

**DBS Electrode Array****CEO/Principal:** Alan Dale Dorval II**Affiliate/Licensee/Univ.:** UU**Univ.:** UU**Cluster:** IT/LS

Massive-Multielectrode, Cross-Hatched Planar Arrays for Deep Brain Stimulation. This device will allow the user to control the direction and shape of the electric field. The proposed device will allow for complete control over the electric field including its shape and direction. No longer will the field center be limited to the electrode contact, and no longer will it be limited to a spherical shape. By using a unique cross shaped electrode with approximately 10,000 contacts, this device will be able to shape the field to fit the particular region of the brain that requires stimulation, without crossing over into undesired regions. DBS treatment with this device will be more effective and safe, and more flexible, as different regions of the brain would not require specially shaped electrodes.

**Distal Access****CEO/Principal:** Shawn P. Fojtik**Affiliate/Licensee/Univ.:** Affiliate**Univ.:** UU**Cluster:** LS/MMEE

Doctors spin needles, catheters, and wires to access deep inside organs or clear catheters and vessels. Spinning by hand gives surgeons feel & control but lack power & speed. Electrical powered 'drill-like' devices give power & speed, but are bulky, expensive, and lack feel & control. Clinicians need a device that combines power & speed with feel & control. The SPINR is a hand-held, mechanical, cost-effective device that spins needles, catheters, and wires when the doctor squeezes their hand. SPINR's simple 6-piece molded design includes a helical gear that converts the squeeze of the handles into axial rotation. Gearing can be adjusted for high-rotation or high-torque applications. Connecting guidewires to the SPINR helps wires vibrate and advance through narrowings or blockages. Oscillating shaped wires and catheter with the SPINR creates a powerful device to macerate blockages in catheters and vessels. SPINR: the speed of a motor with the feel of the hand.

**Domain Surgical****CEO/Principal:** David J. McNally**Affiliate/Licensee/Univ.:** Affiliate**Univ.:** UU**Cluster:** LS

Surgery often requires the cutting and coagulation of vascularized tissues and blood vessels, including the sealing of individual large arteries, veins, and lymphatics. A large market has evolved based upon the promise of improved outcomes related to the sealing and cutting of blood vessels. Innovations intended to improve the speed and integrity of sealing vessels have been introduced in recent years, but many surgeons are still dissatisfied with the performance and security of those devices. Our patent-pending ferromagnetic inductive heating technology holds the promise of producing surface-only tissue effects with energy that does not pass through the patient; uniform sealing with elimination of tissue distortion and sticking; minimizing of collateral or adjacent tissue injury or thermal damage; on-demand rapid onset and offset of effect as various tissues or bleeding are encountered; and easy cleaning and disposability. These attributes position our technology as an ideal energy modality for surgical procedures requiring the sealing of blood vessels of a wide range of sizes.



**Epitel****CEO/Principal:** Mark Lehmkuhle**Affiliate/Licensee/Univ.:** Licensee**Univ.:** UU**Cluster:** IT/LS

A small, user friendly, wireless device for human EEG monitoring is currently lacking. We propose an individual-use patch-type telemetry device for simplified EEG recording from human patients. This device will enable user-friendly application of the EEG electrode and real-time recording of the EEG signal either in the ICU, in an out-of-hospital setting (e.g., the home or work environment), or for research (e.g., antiepileptic drug testing). The device will consist of a small EEG electrode/transmitter unit that both wirelessly transmits EEG signals to a receiver and “logs” EEG data for later retrieval. The only component placed on the patient will be a small unit that is roughly the size of a Band-Aid™ and will have the look and feel of a “patch.” Our primary objective is to create a user-friendly, unobtrusive device that can be used to reliably record acute and/or chronic electrographic seizures under conditions where traditional ambulatory EEG is not feasible or practical.

**H2O TECH****CEO/Principal:** Timothy Nelson**Affiliate/Licensee/Univ.:** Licensee**Univ.:** BYU**Cluster:** LS/MMEE

The Neptune Water Drill provides a scientifically engineered jet stream of water that is less than the thickness of a piece of paper, mixed with tiny particles of abrasive that removes dental caries. It is the most precise cutting device in the dental industry (the Neptune water drill stream diameter is 1/7 the thickness of the most used dental drill bits), which improves the art of dentistry and increases patient satisfaction.

It is a patented invention of Dr. Robert Todd, Professor of Mechanical Engineering at Brigham Young University and Scott C. Hansen. Major benefits include: (1) precision-cutting dentistry, (2) no heat from friction, (3) natural matte finish eliminates phosphoric acid etchings in the drilled out cavity, (4) no drilling sound or vibrations, (5) less irritation of the nerves, (6) reduced need for anesthesia, (7) less post operative pain, discomfort and chance for infection, (8) and lower risk of reoccurring dental caries.

**Holorad****CEO/Principal:** Stephen J Hart**Affiliate/Licensee/Univ.:** Affiliate**Univ.:** UVU**Cluster:** IT

Holorad's technology prints animated interactive color holograms from Computer Graphics scenes designed in animation programs such as Autodesk Maya. This provides glasses-free 3D holograms for entertainment, advertising, and medical applications. These are holographic prints, projecting out in front of the observer with true depth. No other technology provides this rich combination of visual stimuli, and the resulting holograms are very compelling. Hologram production and replay requires custom optical systems, and for cost-effective commercial applications these need to use highly-divergent beams which inherently produce highly distorted holograms. To correct this, Holorad pre-distorts the printed data so that the distortions cancel, producing an undistorted result. The general mathematical basis for this is known in the geometrical optics literature, but has not been extended to the required 3D formulation and implementation, so Holorad currently uses a slow iterative fine-tuning.

**Knudra Transgenics**

**CEO/Principal:** Chris Hopkins  
**Affiliate/Licensee/Univ.:** Licensee

**Univ.:** SLCC  
**Cluster:** LS

Knudra makes biosensors detecting toxicities in our environment, food, and medicines. The nematode worm's capacity to detect toxins is harnessed by genetic engineering the worm to turn green upon exposure to toxin. The observation of turning green is a biosensor of toxicity. We make many types of worm biosensors to detect different types of toxins. We arrange the worm biosensors into arrays where every array well contains a different type of biosensor. Different toxins create different patterns of biosensor activation. A digital readout of toxicity is achieved. This simplifies data interpretation. Data sets are inherently normalized allowing the most important toxic mechanism to be easily identified. Our competition has a wide variety of methods with very little standardization between tests, which leads to confusion in data interpretation. Our method is faster, cheaper, and more reliable than current methods and it uniquely reveals which toxicity mechanism is of highest concern.

**Linear Signal**

**CEO/Principal:** Greg Mockett  
**Affiliate/Licensee/Univ.:** Licensee

**Univ.:** BYU  
**Cluster:** IT

Traditional satellite dish antenna technology suffers from quality of service problems due to poor mount installation, wind loading, rain, roof sag, and satellite orbital wobble. Smart electronically steered phased array feed antennas adjust the antenna beam adaptively to maintain maximum signal quality. Linear Signal has developed a critical enabling part for smart antennas, an integrated beamformer chip, which will be combined with high efficiency, low noise phased array antenna technology developed for radio astronomy by Prof. Warnick at BYU to produce smart antenna feeds for commercial satellite antennas on buildings, aircraft, vehicles, and ships.

**Motion Sensor Suit**

**CEO/Principal:** Carlos Mastrangelo  
**Affiliate/Licensee/Univ.:** UU

**Univ.:** UU  
**Cluster:** IT

We are developing a wireless sensor "suit" that measures the exact movement of the body. This is a superior method to the industry standard motion capture cameras and can be used in 3D animation, life sciences, and sports science. Our sensor system is will be the first of its kind and will overcome the major drawbacks of cameras which require a direct line-of-site and a studio. It is based on state-of-the art MEMS inertial sensors and a local wireless network.

**Natural Asphalt Solutions**

**CEO/Principal:** Kimball Young  
**Affiliate/Licensee/Univ.:** Affiliate

**Univ.:** UU  
**Cluster:** MMEE

Today's commercial/conventional asphalt products represent the tail end of the crude oil refining process. Simply, they are what's left after the best parts of the crude are dedicated to other uses. Naturally occurring Utah oil sands are crude oil before refining. Utah oil sands, based on anecdotal and scientific review, are much better performing road surfacing material in durability and resilience. This technology replaces commercial/conventional asphalt in road surfacing hot mixes with oil sands based on a UDOT specification now in the final stages of development.

**Sera Prognostics**

**CEO/Principal:** Andrew Sauter  
**Affiliate/Licensee/Univ.:** Licensee

**Univ.:** BYU  
**Cluster:** LS

Sera has licensed from BYU and UofU the development and commercial rights to newly discovered biomarkers for multiple pregnancy complications that are measurable in blood samples. Sera is currently developing a commercial test for biomarkers to predict preterm birth that were identified using this proteomic discovery technology. Sera and BYU believe this approach could be used to identify proteomic biomarkers for Endometriosis and would like to pursue a New Project to develop a commercially useful test that would be an alternative to laparoscopies.

**SMEDiagnostics**

**CEO/Principal:** Brad Bertoch  
**Affiliate/Licensee/Univ.:** Licensee

**Univ.:** BYU  
**Cluster:** IT

HSG allows a new venture's effectiveness at commercializing products to be graphically captured by integrating with a New Venture Template™ ("NVT") analysis of 15 quantifiable attributes and a database of hundreds of successful ventures. HSG statistically analyzes large amounts of industry/performance data and a large number of variables (multi-variate analysis) and graphically represents all of the objects, data points and correlations on a single screen. The NVT determines the likelihood of venture success based on 15 specific business attributes and a comprehensive database of NAICS coded companies that have been analyzed for venture success. The output delivers a comprehensive analysis of clients' resource capacity and how they compare with success within their industry. Only large consulting firms use sophisticated analytical tools and manpower to generate the results of HSG, which brings the power of an Accenture-type analysis to SMEs at a fraction of the cost.

**SpeakWorks**

**CEO/Principal:** Ken Meyers  
**Affiliate/Licensee/Univ.:** Licensee

**Univ.:** BYU  
**Cluster:** IT

Web-based presentation feedback management software. In general, the software allows for live web recording of an oral presentation of any kind, and captures feedback synchronized to the video. The software also provides management for the recordings and feedback, including participants, groups, sessions, and feedback providers.

**Synthetic Spider Silk Fibers**

**CEO/Principal:** Randolph V. Lewis  
**Affiliate/Licensee/Univ.:** USU

**Univ.:** USU  
**Cluster:** LS

There are over 100,000 anterior cruciate ligament and 75,000 rotator cuff repair/replacements in the US costing over \$3 billion. Hence, there is a critical need for new repair strategies that provide effective mechanical reinforcement of ligament tears and rotator cuff repair as well as to stimulate and enhance the patient's own intrinsic healing potential. Our goal is to develop spider silk protein fibers for the repair/replacement of ligaments and tendons. The specific aim is to identify the best fiber processing methods to achieve the necessary mechanical properties. The innovation is the use of different "synthetic" spider silk proteins whose properties can be tuned to the planned biomedical application both by the sequence of the protein and the fiber processing methods. The expected outcome is developing materials with superior in vitro characteristics for use as tendon and ligament repair/replacement.

**TheraTarget****CEO/Principal:** Darwin L. Cheney**Affiliate/Licensee/Univ.:** Licensee**Univ.:** UU**Cluster:** LS

Therataarget plans to develop a water-soluble, biodegradable co-polymer that combats cancer. The technology will target solid-cancer tumors (through antibody technology) and release anti-cancer drugs specifically to the cancer site. The attached drug is inert and non-toxic while it circulates through the blood stream, but once the polymer attaches to the solid tumor it becomes engulfed and the anti-cancer drugs become activated thus killing the tumor. The drug carrier when degraded is small enough to be cleared by the kidneys, yet large enough in a non-degraded form to remain in circulation for a sufficient time to be concentrated at the solid tumor site.

**Thermal Management Technology****CEO/Principal:** J. Clair Batty**Affiliate/Licensee/Univ.:** Affiliate**Univ.:** USU**Cluster:** MMEE

Water flow metering is being mandated in more applications including secondary water use. Needed are low-cost/durable flow and “excessive-use” meters (as alarms for breakage) that tolerate sedimentary flow. Modern flow meters are expensive, complex, easily fouled, and impractical for silt-laden secondary water. The proposed non-obtrusive flow meter (NFM) is low cost, has no moving parts, no fouling potential. Small thermal/optical sensors strategically placed within the circumference of and nearly flush with the internal walls of NFM react to flow across and around their surfaces. Convective heat transfer and optical diffusion algorithms, combined with lab calibrations yield volumetric flow. Because NFM flow is determined from brief pulses of power without attaining steady state, a smaller power source—low voltage AC/DC—is required. Compact, solar and battery-assisted options exist. External logic modules provide continuous or intermittent data uploads to Bluetooth or wireless devices

**ViroPan****CEO/Principal:** Tyler McCabe**Affiliate/Licensee/Univ.:** Licensee**Univ.:** UU**Cluster:** LS

Aqua-Ring is a novel medical grade polyurethane intravaginal ring (IVR) that steadily delivers ~5 mL of natural vaginal-like fluid over 5 days to treat vaginal dryness in peri- and post-menopausal women. It is a “smart” device that is self-inserted weekly and has the ability to sense the moisture need in the vagina and release fluid on-demand to supplement the lubricating fluids of the vaginal mucosa. Since women experience very different levels of vaginal dryness, Aqua-Ring has a truly unique design and is woman-specific personalized therapy that will not under treat or over treat the vaginal dryness symptoms. There is no other product that can provide this natural and personalized remedy. This product addresses all of the negatives of current estrogen replacement therapies, with their risk of cancer and heart disease, and OTC gels, with their messiness and short duration. The regulatory strategy is to seek market clearance through the Premarket Notification 510(k) pathway in 2013.

**Vutara****CEO/Principal:** Stan Kanarowski**Affiliate/Licensee/Univ.:** Licensee**Univ.:** UU**Cluster:** IT/LS

Vutara has coupled cutting-edge breakthroughs in photophysics and computation to create a new super-resolution microscope, the SR-200. The SR-200 microscope is a super-resolution fluorescence microscope that combines new hardware (microscope and peripherals) and software (operational and analytical tools). Vutara SR-200 Bi-plane Technology - For over a century the work defining light microscopy resolution limits has stood to affirm that resolutions below the diffraction would be inherently out of reach, relegating science to postulate as to the localization of small objects. Today, however, we find ourselves in the midst of an optical revolution, with the introduction of several new lens based, light microscopes capable of smashing the diffraction limit, approaching single molecule resolutions. These systems have redefined light microscopy and been termed “Super-Resolution” or “Sub-diffraction” microscopes, with recent commercial introduction to the global scientific market.